

NORTH BAY
AREA

***water pollution
control plant***

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Joint Local Advisory Committee
of the North Bay Area Pollution Control Works,
City of North Bay.

Gentlemen:

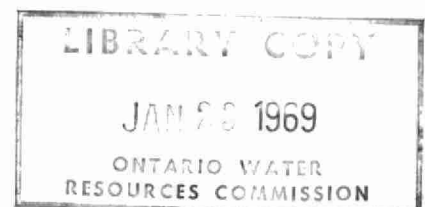
We are happy to present you with the 1967 Operating Summary for the North
Bay Area Water Pollution Control Plant, OWRC Project No. 2-0010-58.

Your co-operation with our staff throughout the year has been appreciated.
Only with such co-operation can the war against water pollution be waged
effectively.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,
General Manager.





ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET
TORONTO 5

J. A. VANCE, LL.D.
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J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

TELEPHONE 365-

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the North Bay Area Water Pollution Control Plant, OWRC Project No. 2-0010-58.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

A handwritten signature in dark ink, reading "D. A. McTavish".

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

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NORTH BAY AREA
water pollution control plant

operated for

THE CITY OF NORTH BAY

and

THE TOWNSHIPS OF WIDDIFIELD AND WEST FERRIS

by the

ONTARIO WATER RESOURCES COMMISSION

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DIVISION OF PLANT OPERATIONS

DIRECTOR: D. A. McTavish

Assistant Director: C. W. Perry
Regional Supervisor: P. J. Osmond
Operations Engineer: R. Kauppinen

801 Bay Street Toronto 5

'67 **REVIEW**

A total of 1,438 million gallons of sewage was treated in 1967 at an average daily flow of 3.94 million gallons compared to 3.80 million gallons in 1966. The average daily flow exceeded the design plant flow of 4.0 million gallons per day approximately 52 percent of the time.

The average concentration of the raw sewage was 164 ppm BOD and 224 ppm suspended solids. The average concentration of the final effluent was 18 ppm BOD and 30 ppm suspended solids indicating reductions of 89.9% and 86.6% respectively.

The cost of operating the plant in 1967 was \$94,418.15 compared to \$87,375.11 in 1966. The cost of treatment was \$65.65 per million gallons compared to \$63.02 in 1966.

Settlement occurred in the sumps of both final clarifiers. Major repairs were required including the driving of additional piles. The total cost of the repairs was \$22,061.07 of which \$15,192.07 was to be paid by Insurance and \$6,869.00 from the Reserve Fund.

PROJECT COSTS

NET CAPITAL COST

North Bay	\$1,162,778.90	
West Ferris	899,874.10	
Widdifield	<u>251,890.73</u>	
Long Term Debt to OWRC (Estimated)	<u>\$2,314,543.73</u>	
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967		
North Bay	\$ 223,634.29	
West Ferris	157,908.78	
Widdifield	<u>32,037.95</u>	
TOTAL	\$ <u>413,581.02</u>	

The total cost to the municipalities during 1967 was as follows:

NET OPERATING

North Bay	\$66,725.31	
West Ferris	19,072.64	
Widdifield	<u>12,839.29</u>	\$ 98,637.24

DEBT RETIREMENT

North Bay	\$23,465.00	
West Ferris	18,160.00	
Widdifield	<u>5,083.00</u>	\$ 46,708.00

RESERVE

North Bay	\$ 6,959.68	
West Ferris	4,812.85	
Widdifield	<u>1,116.28</u>	\$ 12,888.81

INTEREST CHARGED

North Bay	\$65,558.27	
West Ferris	50,734.58	
Widdifield	<u>14,197.33</u>	\$ <u>130,490.18</u>
TOTAL	\$ <u>288,724.23</u>	

RESERVE ACCOUNT

BALANCE AT JANUARY 1, 1967 (Revised)

North Bay	\$59,880.37	
West Ferris	40,117.29	
Widdifield	<u>6,761.95</u>	\$106,759.61

DEPOSITED BY MUNICIPALITY

North Bay	\$ 6,959.68	
West Ferris	4,812.85	
Widdifield	<u>1,116.28</u>	\$ 12,888.81

INTEREST EARNED

North Bay	\$ 3,554.90	
West Ferris	2,384.25	
Widdifield	<u>395.78</u>	\$ <u>6,334.93</u>
		\$125,983.35

LESS EXPENDITURES

North Bay	\$ 8,148.40	
West Ferris	4,418.84	
Widdifield	<u>797.06</u>	\$ <u>13,364.30</u>

Balance at December 31, 1967		<u>\$112,619.05</u>
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MONTHLY OPERATING COSTS

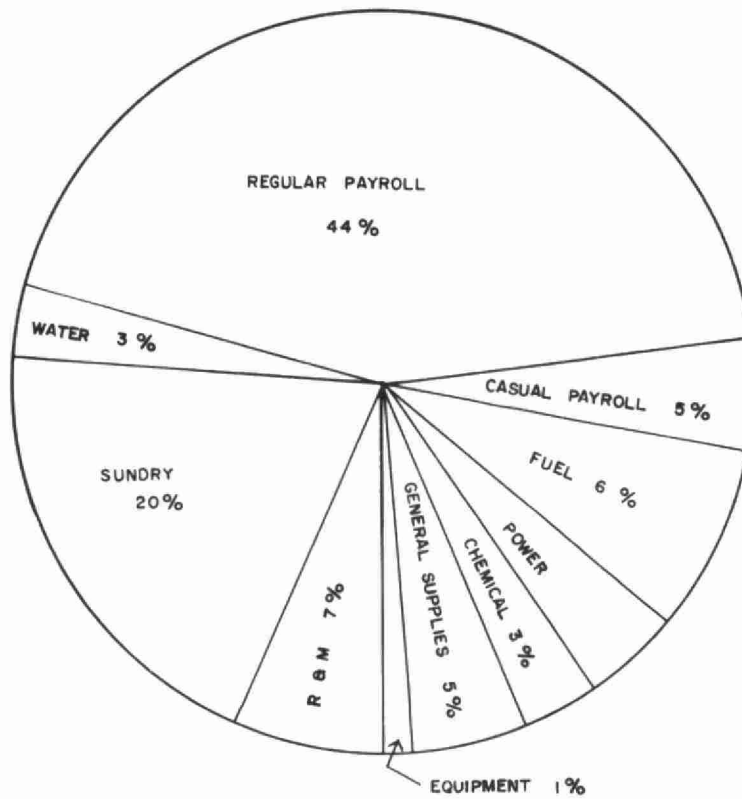
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	4,756.60	3,102.19		680.22			90.68	5.99	777.64	36.38	3.50
FEB	5,466.62	2,904.67		635.81	347.57		334.30		180.88	1032.13	33.50
MARCH	7,934.21	4,883.24		611.60	278.56		410.29	253.06	170.08	1323.80	3.50
APRIL	6,607.53	2,566.01	214.18	693.00	317.68		704.44		585.02	1612.90	3.50
MAY	12,537.54	2,915.09	534.06	784.08	331.66	1955.10	522.45	447.20	968.00	3825.76	254.14
JUNE	8,739.89	3,913.97	698.40	779.40	312.87		771.14		418.08	1549.05	296.98
JULY	7,670.31	3,002.22	751.71	743.58	316.65		680.61		401.59	1371.40	402.55
AUG	7,213.29	3,307.38	737.50	754.74	289.49	317.10	328.60		236.59	846.07	395.82
SEPT	9,493.32	5,019.98	906.62	591.08	325.35		290.93	24.57	346.58	1491.10	497.11
OCT	8,948.52	3,106.65	357.50	457.14	335.42	792.75	182.18	262.94	1167.51	1807.38	479.05
NOV	7,747.73	3,202.94	393.34	574.11	330.13		205.93		270.18	2340.40	430.70
DEC	7,010.39	3,306.78	82.81	555.62	651.10		216.25		755.63	1266.39	175.81
TOTAL	94,418.15	4,1291.12	4,676.12	7860.38	3836.48	3064.95	4337.80	993.76	6278.58	18702.60	2976.16

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$12,920.13

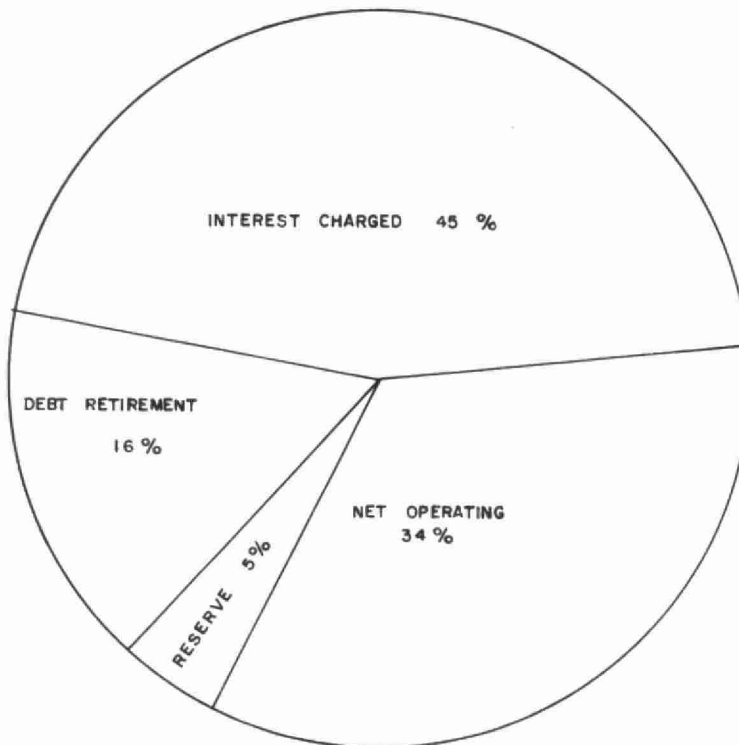
YEARLY OPERATING COSTS

YEAR	M. G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1961	1430,000	\$ 7488.15	\$52.37	4 CENTS
1962	1118,630	68352.13	61.09	6 CENTS
1963	1234,303	67131.06	54.39	4 CENTS
1964	1234,328	72953.91	59.10	4 CENTS
1965	1379,973	79171.60	57.37	6 CENTS
1966	1386,417	87375.11	63.02	6 CENTS
1967	1438,242	94418.15	65.65	4 CENTS

1967 OPERATING COSTS



TOTAL ANNUAL COST

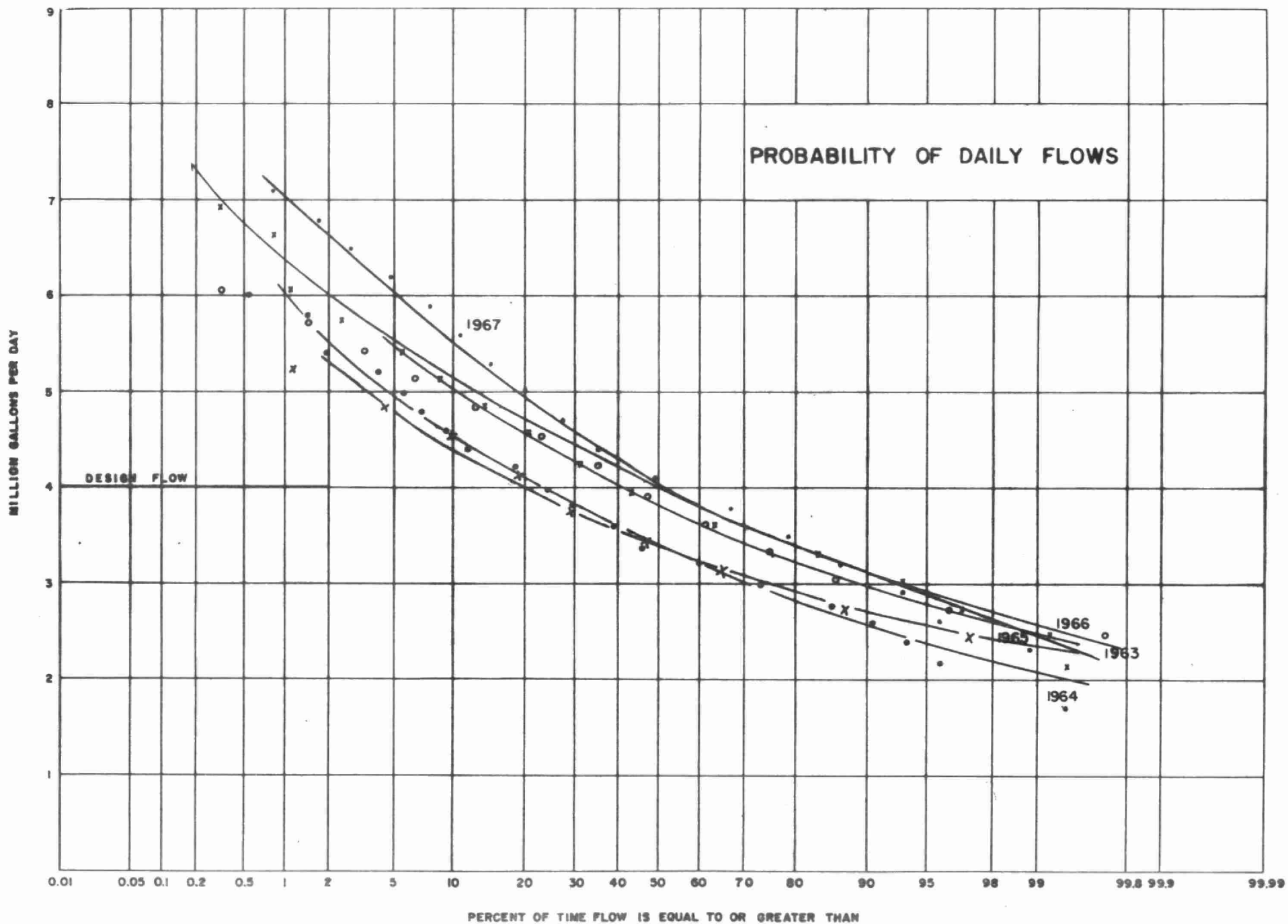


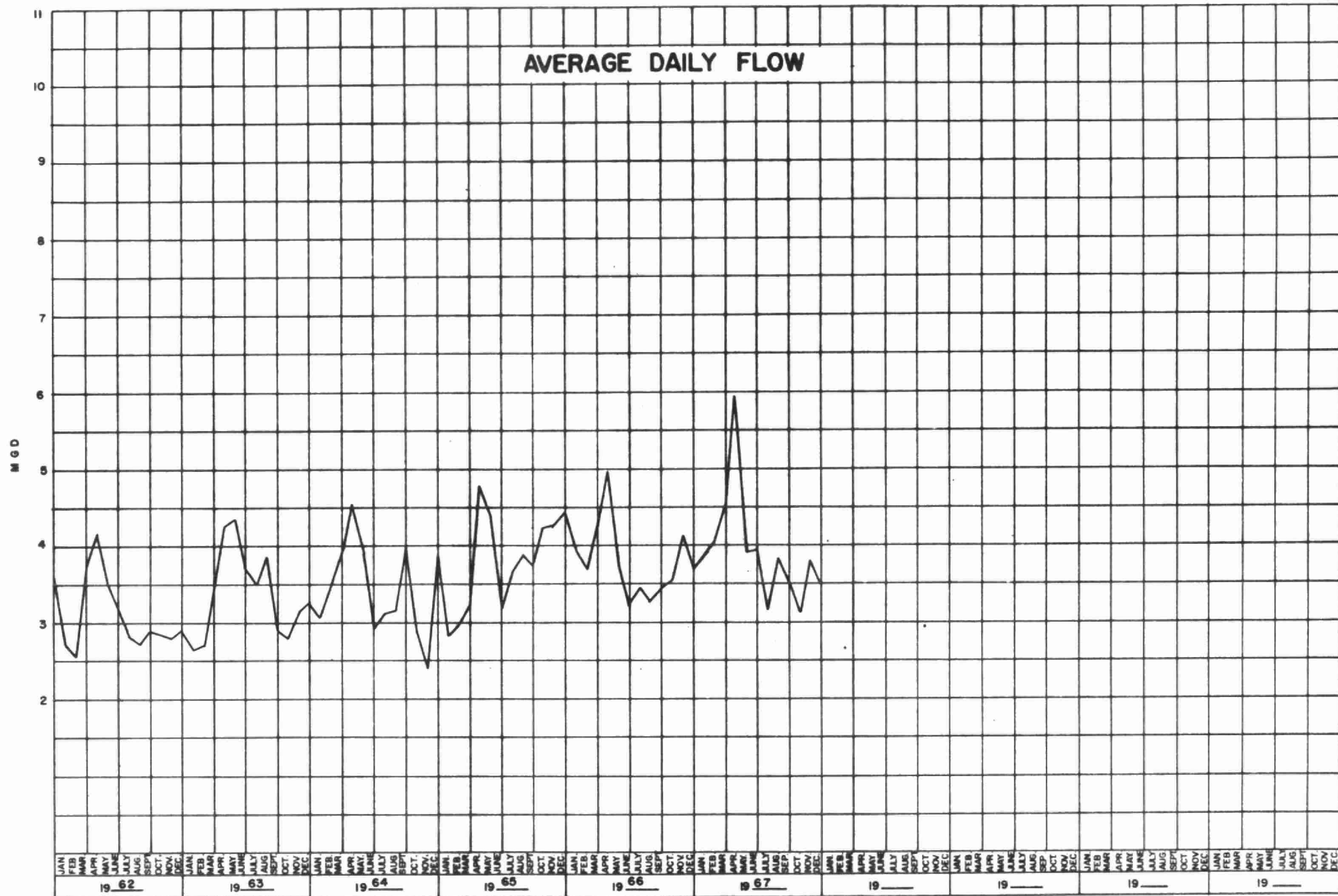
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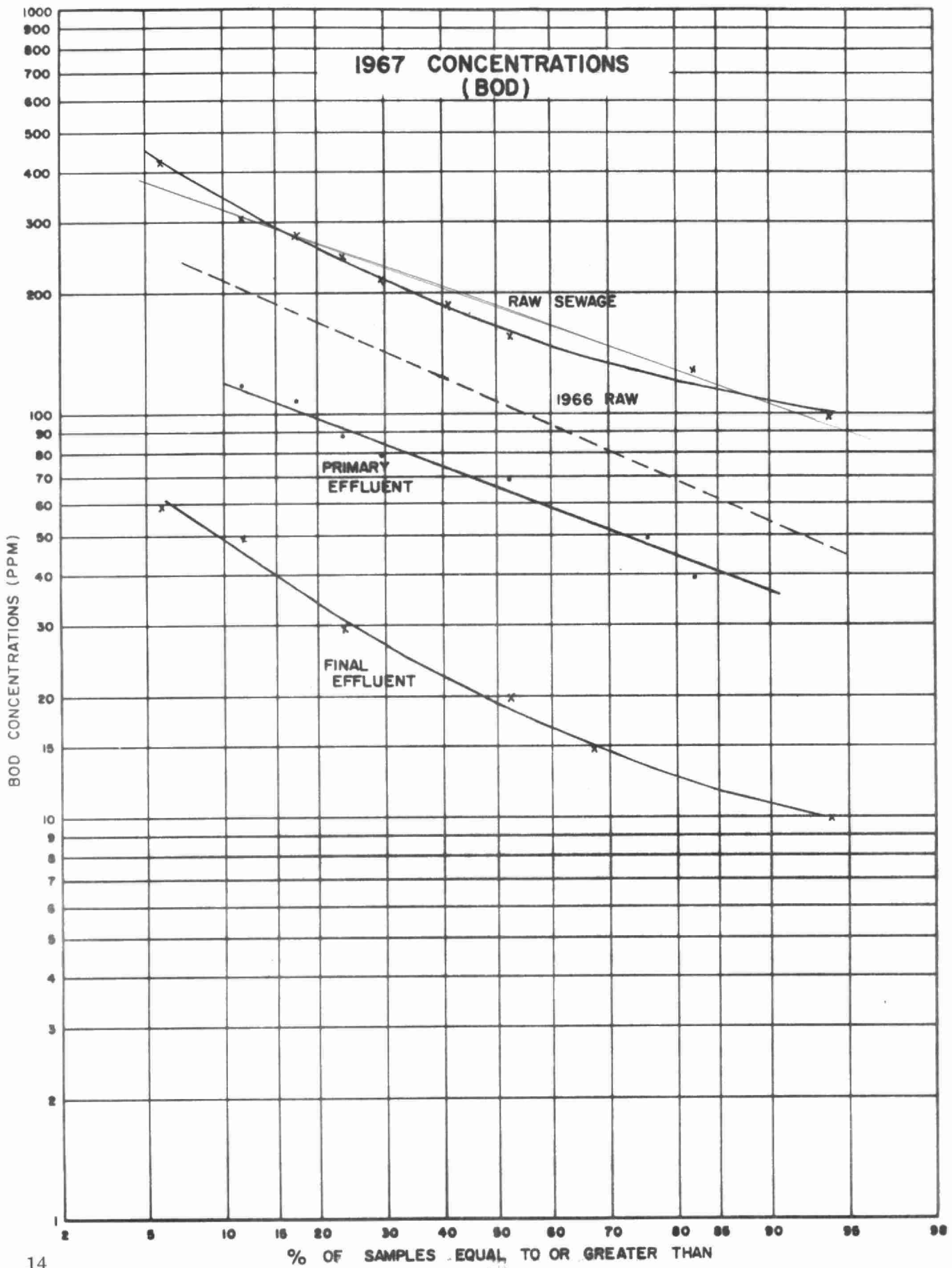
FLows

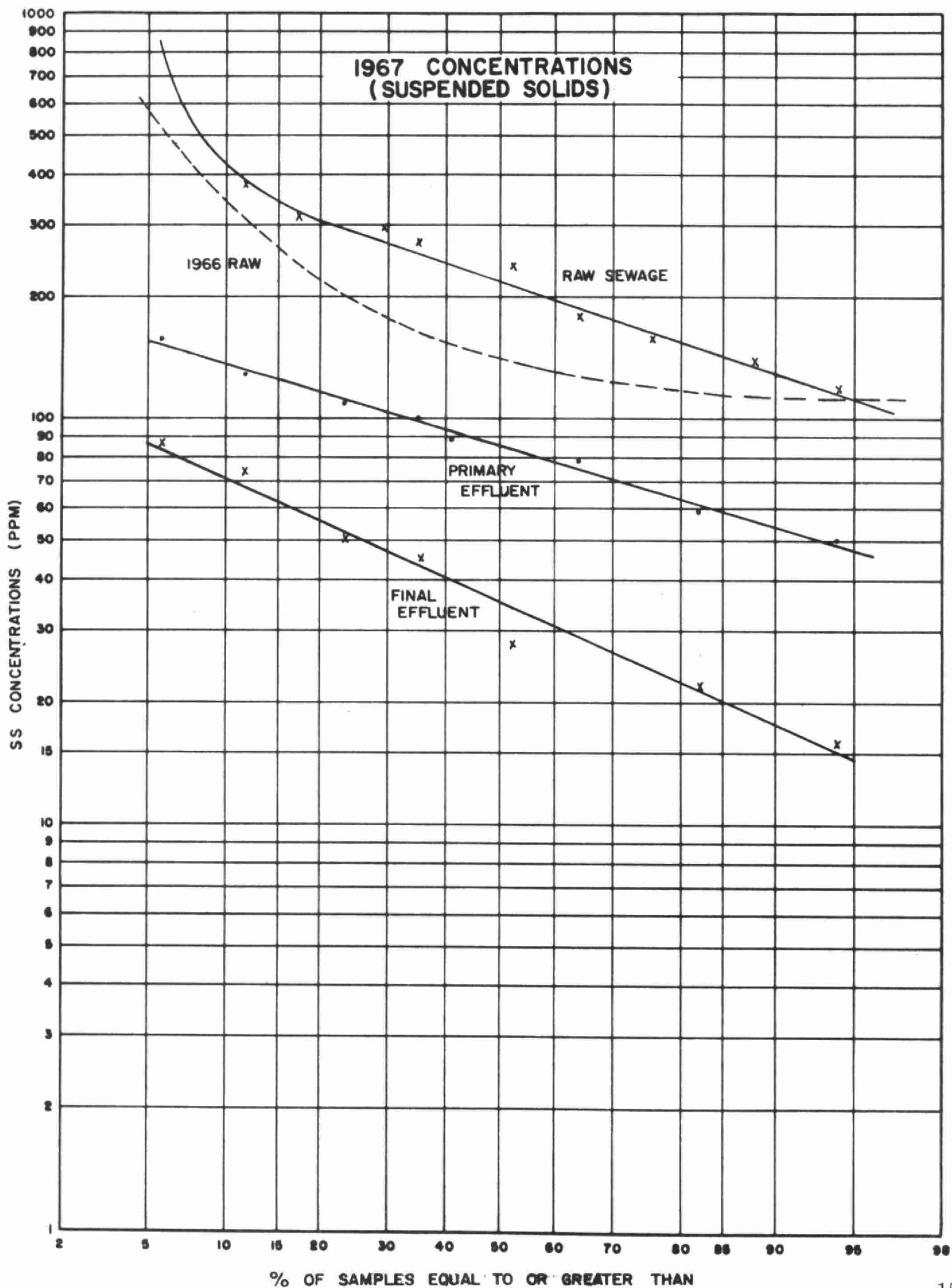
A total of 1,438.242 million gallons was treated during the year. This represents an average daily flow for the year of approximately 3.94 mgd compared to 3.80 mgd in 1966.

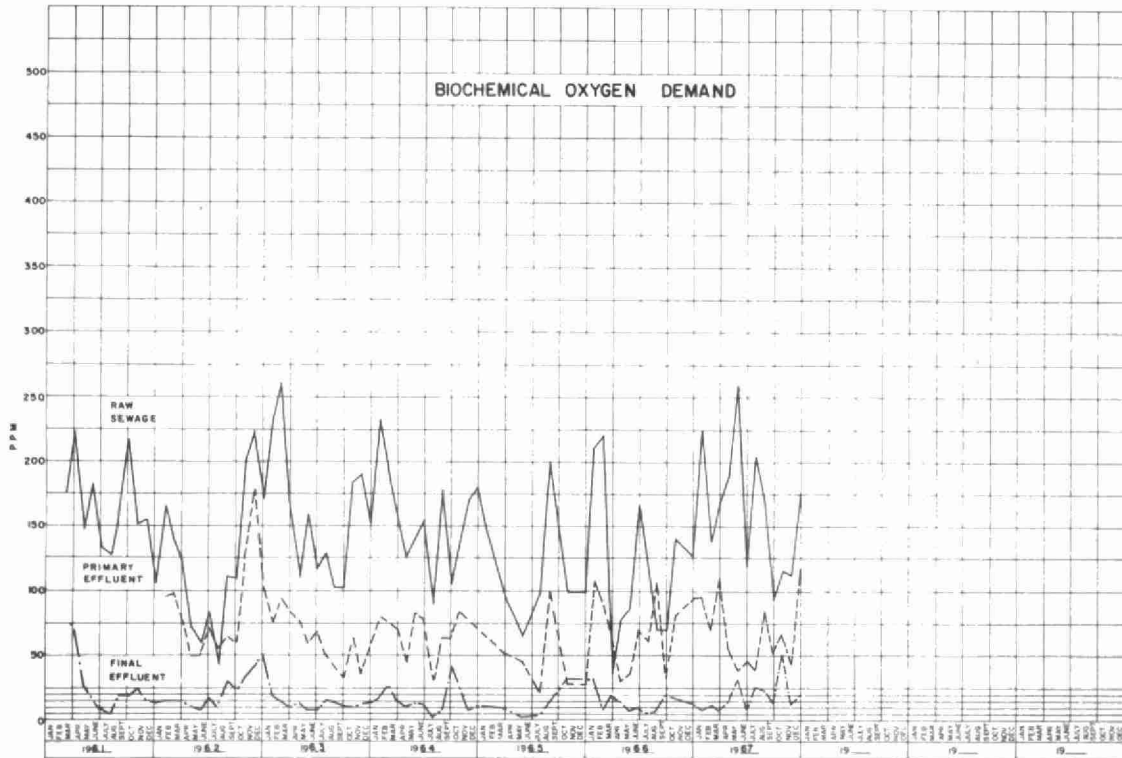
The average daily flow graph shows that the average daily flow for the months of February, March and April exceeded the plant design flow of 4.0 mgd. The probability of daily flows graph shows that approximately 52 percent of the time the flows to the plant exceeded a flow of 4.0 mgd. Also, approximately 19 percent of the time the flows exceeded 5.0 mgd.



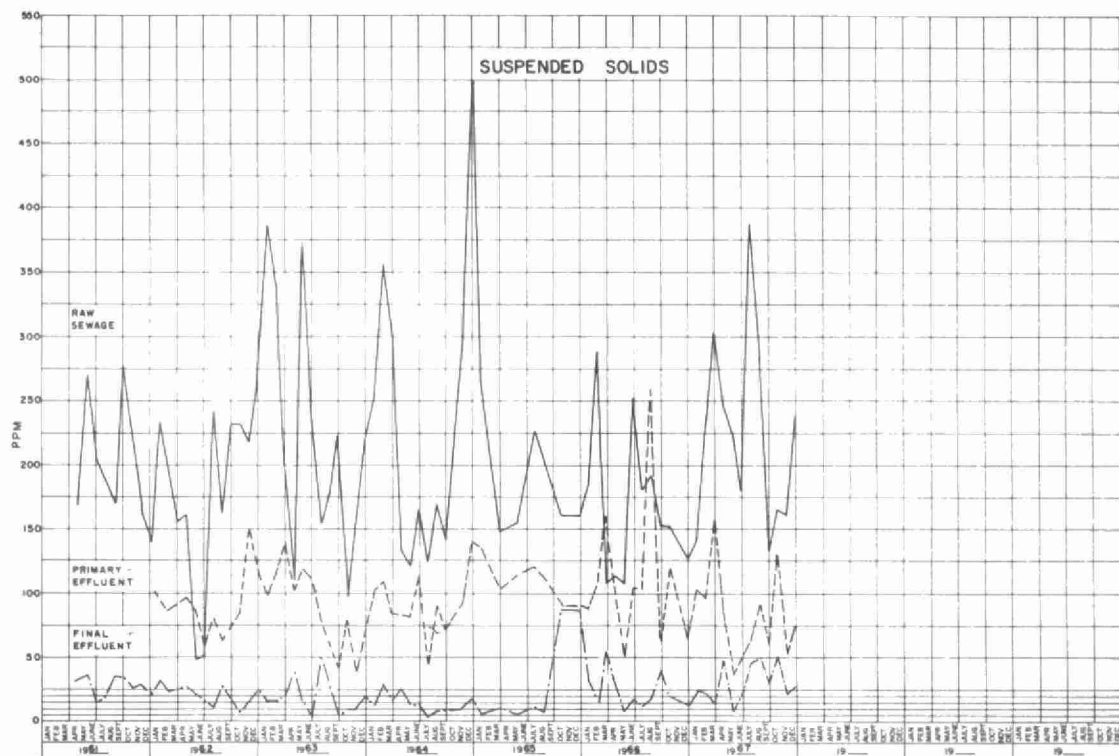








MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

N.B

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	225	8.4	96.3	133.89	142	23	83.8	71.14	458
FEB.	138	10	92.8	72.95	232	21	90.9	120.21	557
MAR.	170	7.2	95.8	114.19	302	14	95.4	202.01	820
APR.	188	13	93.1	156.72	246	47	80.9	178.21	505
MAY	260	30	88.5	138.32	224	9	96.0	130.70	510
JUNE	118	7.4	93.7	65.36	174	22	87.4	89.83	598
JULY	204	25	87.7	86.48	387	44	88.6	165.72	400
AUG.	167	22	86.8	87.03	283	48	83.0	141.04	448
SEPT.	92	13	85.9	42.11	132	29	78.0	54.90	718
OCT.	116	50	56.9	32.59	166	51	69.3	56.78	367
NOV.	112	13	88.4	56.96	160	22	86.2	79.26	396
DEC.	175	18	89.7	85.27	234	26	88.9	112.96	350
TOTAL	-	-	-	1071.87	-	-	-	1402.76	6127
AVG.	164	18	89.0	89.32	224	30	86.6	116.90	511

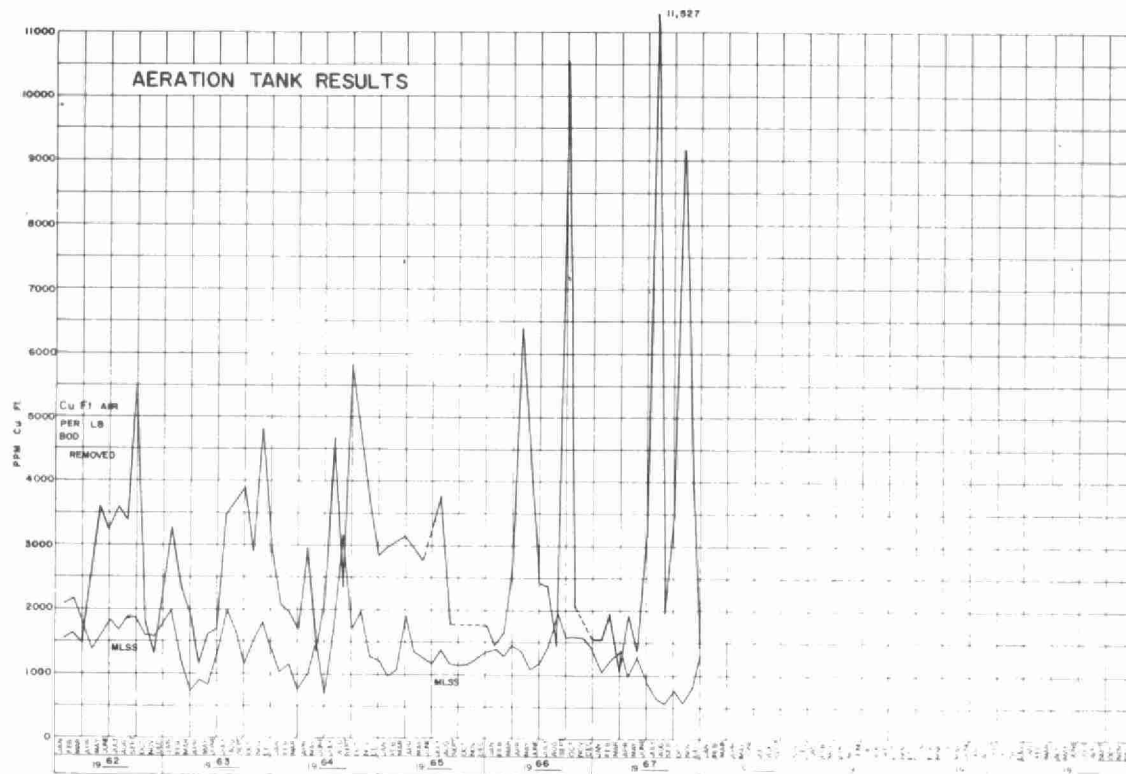
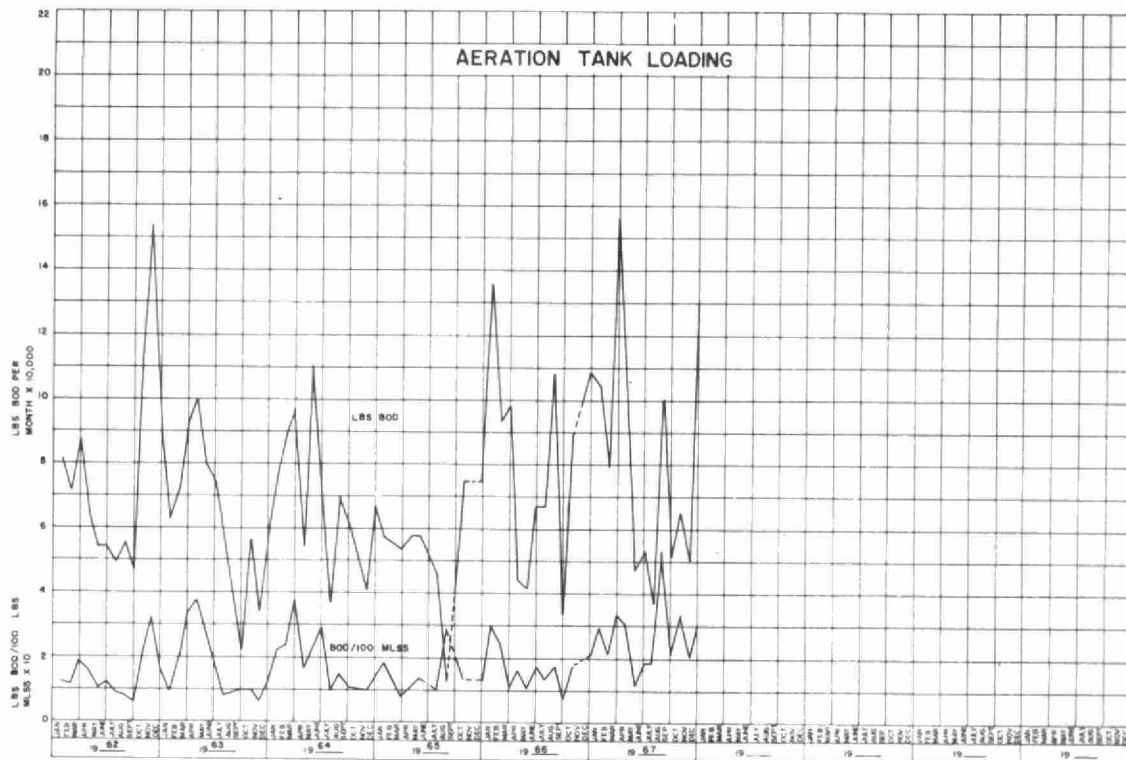
COMMENTS

Raw sewage having an average concentration of 164 ppm in BOD and 224 ppm in suspended solids was treated in 1967. Final effluent had an average concentration of 18 ppm in BOD and 30 ppm in suspended solids. These final effluent concentrations were above the OWRC objectives of 15 ppm in BOD and 15 ppm in suspended solids.

The strength of the raw sewage has increased from 1966 when it was 120 ppm in BOD and 169 ppm in suspended solids. The average percent reduction in 1967 was 89.0% in BOD and 86.6% in suspended solids. The reductions are in the range expected for a secondary treatment type of plant.

An estimated total of 1072 tons of BOD and 1403 tons of suspended solids were removed during the year.

A total of 6127 cubic feet of grit was removed for an average of 4.26 cubic feet of grit per million gallons treated.



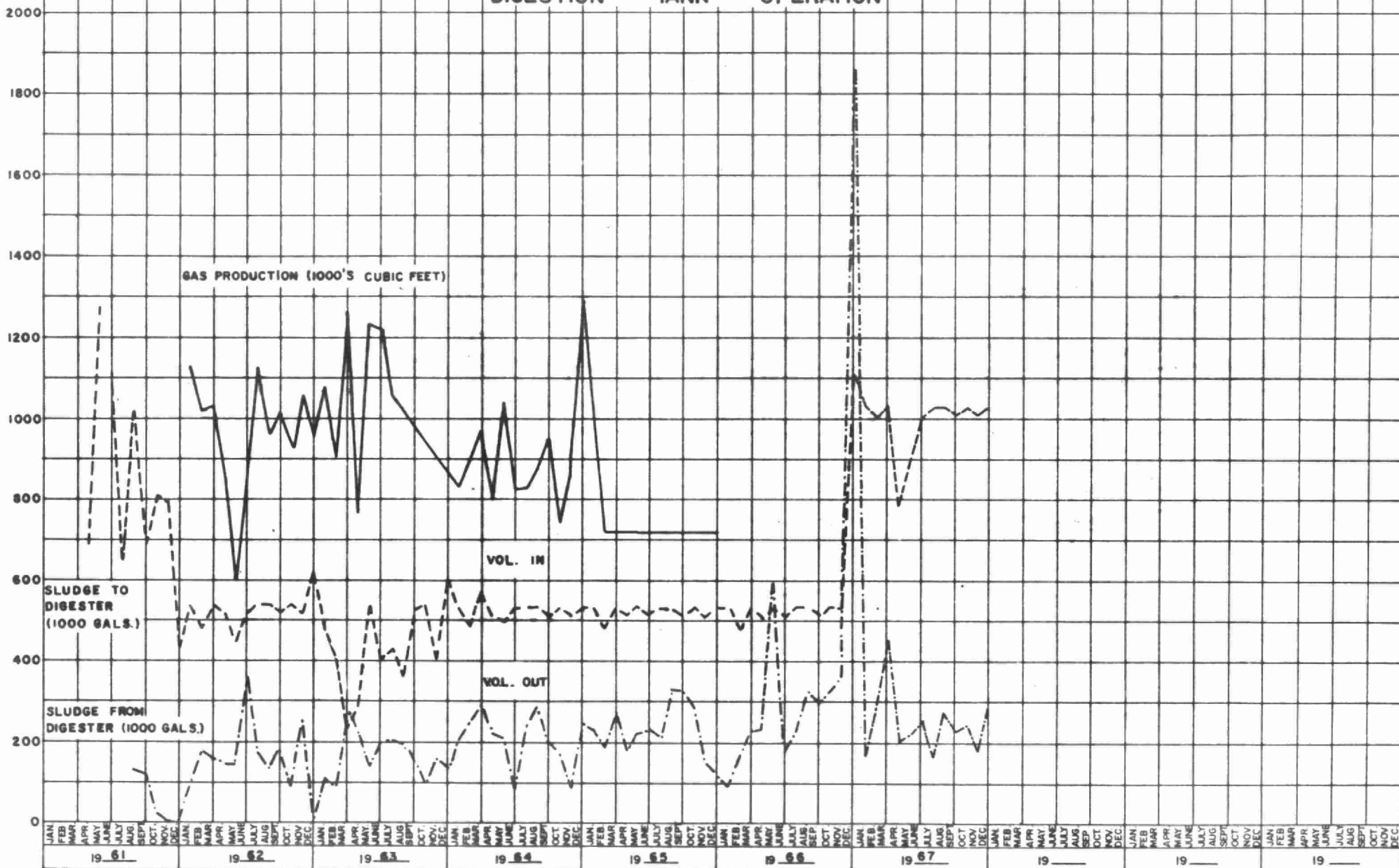
AERATION SECTION

MONTH	PRIM. EFFL B.O.D. PPM.	MLSS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	88	1051	29	1524
FEBRUARY	69	1216	21	1948
MARCH	110	1360	33	1006
APRIL	54	994	30	1912
MAY	39	1269	11	13257
JUNE	45	892	18	3160
JULY	38	602	18	11527
AUGUST	83	548	53	1981
SEPTEMBER	51	757	21	3466
OCTOBER	66	576	33	9195
NOVEMBER	44	760	20	3943
DECEMBER	120	1290	30	1309
TOTAL	-	-	-	-
AVERAGE	63	943	26	4519

COMMENTS

The average primary effluent BOD was 63 ppm in 1967 and the average MLSS concentration was 943 ppm which resulted in a loading of 26 lbs. of BOD per 100 lbs. of MLSS. An average of 4519 cubic feet of air was used per pound of BOD removed which is higher than the 1966 average.

DIGESTION TANK OPERATION



DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS		
	GALLONS	% SOLIDS	% VOL. MAT.	GALLONS	% SOLIDS	% VOL. MAT.
JAN.	1,116,000			168,564		
FEB.	1,008,000	2.88	65.3	278,919	7.22	27.84
MAR.	1,116,000			454,293		
APR.	792,000	3.37		200,458	5.23	
MAY	900,000	3.68		220,877	.20	
JUNE	1,080,000	2.53		251,877	1.33	
JULY	1,116,000	1.29		162,751	4.70	
AUG.	1,116,000	2.44		269,400	5.91	
SEPT.	1,080,000	.17		234,440	3.28	
OCT.	1,116,000	2.70		242,106		
NOV.	1,080,000			186,002		
DEC.	1,116,000			288,606		
TOTAL	12,633,000			2,958,293		
AVG.	1,052,750	2.38	65.3	246,524	3.98	27.84

COMMENTS

During the year a total of 12,633,000 million gallons of raw sludge was pumped to the digesters. At an average concentration of 2.38 percent solids. A total of 2,958,293 million gallons of digested sludge was removed from the digesters. The digested sludge had a solids concentration of 3.98 percent.

CHLORINATION

PLANT FLOW IN MILLIONS OF GALLONS

JANUARY	119.569	JULY	96.630
FEBRUARY	113.979	AUGUST	120.038
MARCH	140.282	SEPTEMBER	106.610
APRIL	179.107	OCTOBER	98.755
MAY	121.582	NOVEMBER	114.871
JUNE	118.200	DECEMBER	108.619
TOTAL		1,438.242	
AVERAGE		<u>119.853</u>	

COMMENTS

Chlorination was in practice from April 1 to November 1 in 1967. A chloride residual of 0.5 ppm was maintained in the plant effluent.

No figures for chlorine dosage are available since no means of weighing one ton cylinders are available.

LABORATORY LIBRARY



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CONCLUSIONS

1. The plant is operating at approximately the design capacity of 4.0 mgd.
2. The average BOD concentration has increased significantly from the previous year. However, it is still less than the normally anticipated value.

RECOMMENDATIONS

1. Consideration should be given now to plant expansion as discussed in the Gore & Storrie Report.

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